

**Remarks/Arguments**

**35 U.S.C. §103**

Claims 1-9 stand rejected under 35 U.S.C. §103(a) as being unpatenable over Gadeyne et al. (US Patent No. 6,359,663 B1) in view of Iwaki (JP Patent No. 08-088770) and Takahashi et al. (US Patent No. 6,181,368 BI) and Levine (Us Patent No. 4,499,497).

As to claim 1, the office action states Gadeyne et al. teaches a method for reducing sparkle artifact in a liquid crystal imager (See Fig. 1a-1c, items 1-7, in description See Col. 2, Lines 46-51 and Col. 5, Lines 15-25). However, applicant does not find a teaching for reducing sparkle artifacts in the above cited text of Gadeyne, or elsewhere in Gadeyne's specification. Gadeyne's summary of his invention is provided below for reference.

"The conversion or generation of the video signal is so that motion artifacts which are caused by the difference in luminance response times for rise and decay such as large area luminance jumps, large-area flicker and faulty temporary large-area luminance are fundamentally cancelled in the displayed image."

The cited portion of Gadeyne, (col 2 lines 46-51) states:

" It is the aim of this present invention to remove luminance jumps and visible artefacts resulting from said luminance jumps in a displayed image during and immediately after the movement of the image, the luminance jumps and the artefacts caused by a difference in luminance rise and fall times of the display screen on which the image is displayed."

The cited portion of Gadeyne (col 5 lines 15-25) states:

"A first example of a specific image is illustrated in FIG. 1a, FIG. 1b and FIG. 1c. An image display 1 has on its display screen 2 a specific image 3 characterised by a high noise content, the image being scrolling down at such a slow speed that the scrolling steps are individually perceptible. FIG. 1b shows an enlarged part 4 of the specific image 3, its location referred to the image being shown in FIG. 1a, FIG. 1b and FIG. 1c illustrate a downward scrolling step equal to the difference between the distance 5 of a bright image point 6 to the top border of the image before a scrolling step and the distance 7 after the scrolling step."

The above paragraphs of Gadeyne do not refer to sparkle artifacts. Applicant is entitled to the meaning of the term "sparkle " as defined in applicant's specification. As such applicant addresses a type of artifact (sparkle artifact) not discussed in Gadeyne. A sparkle artifact as defined in applicant's specification, is different from a luminance jump as defined by Gadeyne. Sparkle is clearly defined by applicant as follows.

"Thus, at lower brightness levels, adjacent pixels that are only moderately different in brightness need to be driven by very different voltage levels. This produces a fringing electrical field having a component orthogonal to the desired field. This orthogonal field produces a brighter than desired pixel, which in turn can produce undesired bright edges on objects. The presence of such orthogonal fields is denoted disclination. The image artifact caused by disclination and perceived by the viewer is denoted sparkle.

In contrast Gadeyne defines luminance jumps as, "artefacts caused by a difference in luminance rise and fall times". And further, "On a display screen with a luminance rise time different compared to the luminance fall time as it is typical for an LCD display device, the luminance fall (or rise) of the white spot at the first location 12 will be different from the simultaneous luminance rise (or fall) of the white spot at the same instant at the second location 13; the total luminance integrated over the screen area 14 is not equal immediately before, during and after the movement of the white point."

One of ordinary skill in the art would not expect a solution to a problem of luminance jumps to solve a problem caused by orthogonal fields in adjacent pixels (sparkle). Specifically, the solution taught by Gadeyne is summarized in Gadeyne's specification.

"This is obtained by a method for converting a first video signal into a second video signal, the second video signal being intended for being displayed on a display device with different luminance rise and fall times, ... The conversion is so that the second video signal causes the luminance time response of a picture element ... to a change of the first video signal... to be substantially equal in shape and amplitude but reversed (i.e., inverted) in slope compared to the luminance time response of the same or another picture element... to a change of the first video signal... The luminance time responses can be made substantially equal to `predefined luminance time responses`."

There is no suggestion of any solution applicable to a problem of sparkle.

Therefore applicant respectfully submits Gadeyne does not contain any teaching related to, or applicable to, sparkle artifacts.

The office action further states Gadeyne et al. does not show a step of dividing a video signal for a picture into a higher brightness level signal and lower brightness level signal. Applicant agrees.

The office action states Iwaki teaches dividing a video signal for a picture into a higher luminance (brightness) level signal and lower luminance (brightness) level signal, delaying one of the signals (Drawing 1, items 1-12, in Detailed Description See page 1-3, paragraphs 008-0015). Applicant respectfully disagrees.

Applicant respectfully submits Iwaki fails to disclose or suggest any approach useful or adaptable for reducing the effects of orthogonal fields in adjacent pixels. Iwaki is directed to facsimile apparatus (paragraph 0001). Facsimile apparatus do not suffer the effects induced in an LCD display by orthogonal fields of adjacent pixels. Iwaki teaches a way to increase resolution by mapping two pixels (white white; white black; black black) to one pixel based on the brightness level of one pixel. (See paragraph 21). This mapping occurs on a pixel by pixel basis.

Further, Iwaki fails to teach a step of "delaying said higher brightness level signal to match a processing delay incurred by said low pass filtering" as recited in applicant's claim 1. The delay disclosed by Iwaki is applied regardless of brightness level. Please refer to Iwaki schematic drawing 1. It can be seen that delay elements 1,2,and 3 are employed without any brightness determination as made by comparators 4,5,6 and 7. The results of the comparison are provided to a threshold generating circuit 10 and are not subject to any delay based on brightness level. Therefore, Iwaki fails to teach a step of "delaying said higher brightness level signal to match a processing delay incurred by said low pass filtering".

Furthermore, there is no suggestion in Iwaki that his teaching of classifying pixel brightness level in order to replace one pixel data by two pixel data to increase resolution has any applicability to an LCD sparkle artifact problem.

The office action states it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Iwaki approach for reducing sparkle artifacts in the Gadeyne et al. method to obtain age with fidelity without causing a pattern (See Purpose in Iwaki reference). Applicant respectfully asserts that the Office has failed to meet its burden of establishing a prima facie case of obviousness regarding the combination

of Gadeyne and Iwaki. See MPEP 2143 Basic Requirements of a *Prima Facie* Case of Obviousness :

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

First, the office has failed to cite a suggestion or motivation either in the references themselves or in the knowledge generally to modify or combine the reference teachings in order to make applicant's claimed invention.

Second, one of ordinary skill in the art would not have a reasonable expectation of success in making applicant's claimed invention based on any teachings or suggestions in either reference. One of ordinary skill in the art seeking "to obtain age with fidelity without causing a pattern" and at the same time arrive at applicant's claimed invention would could not be expected to succeed. Applicant does not claim an invention for methods or apparatus "to obtain age with fidelity without causing a pattern".

The office action states Gadeyne et al. and Iwaki do not show low pass filtering lower brightness level signal. Applicant agrees.

The office action states Takahashi et al. teaches how to remove the noise components for low brightness area using low pass filters (See Fig. 5, 22-23, items 34, 0-B, in description See Col. 7, Lines 40-44).

The office action states it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Takahashi et al. approach for reducing sparkle artifacts in the Gadeyne et al. and Iwaki method to remove noise components in the signal (See Col. 7, Lines 43-45 in Takashi et al. reference).

Applicant respectfully asserts that the Office has failed to meet its burden of establishing a *prima facie* case of obviousness regarding the combination of Gadeyne, Iwaki

and Takahashi et al. See MPEP 2143 Basic Requirements of a *Prima Facie* Case of Obviousness.

1. None of the references teach any approach for reducing the effects of orthogonal field components in adjacent pixels (sparkle artifacts).

2. Applicant does not claim an invention relating to methods or apparatus "to remove noise components in the signal". Therefore a question of whether one of ordinary skill in the art would be motivated to combine any references "" to remove noise components in the signal" is not relevant to an obviousness inquiry regarding applicant's claimed invention.

Applicant respectfully requests withdrawal of the rejection, or a clear statement of the basis for this rejection.

The office action states Gadeyne et al., Iwaki and Takahashi et al. do not teach combining low pass filtered lower brightness level signal and delay matched higher brightness level signal to generate modified video signal yielding reduced sparkle artifacts in imager. Applicant agrees.

The office action states Levine teaches combining low brightness video signal and delayed signal to provide fully processed video signal (See Fig. 1-2, items 27-29, in description See Col. 3, Lines 44-55). Therefore, the office action states it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Levine approach for reducing sparkle artifacts in the Gadeyne et al. Iwaki, Takahashi et al. apparatus to improve signal-to-noise ratio (See Col. 1, Lines 35-40 in Levine reference).

Applicant respectfully asserts that the Office has failed to meet its burden of establishing a prima facie case of obviousness regarding the combination of Levine, Gadeyne et al. , Iwaki, and Takahashi et al. See MPEP 2143 Basic Requirements of a *Prima Facie* Case of Obviousness. Applicant does not claim to have invented an apparatus or method for improving signal to noise ratio. Further, none of the above references teach or suggest any solutions applicable to the problem of orthogonal fields in adjacent pixels (sparkle artifacts)

As to claim 11, the office action states Gadeyne et al. teaches a circuit for reducing sparkle artifact in a liquid crystal imager (See Fig. 1a-1c, items 1-7, in description See Col. 2, Lines 46-51 and Col. 5, Lines 15-25). Applicant disagrees for the same reasons outlined with regard to claim 1. The above cited paragraphs of Gadeyne do not contain any reference to sparkle artifacts. Applicant is entitled to the

meaning of the term "sparkle " as defined in applicant's specification. As such applicant addresses a type of artifact (sparkle artifact) not discussed in Gadeyne. A sparkle artifact as defined in applicant's specification, is different from a luminance jump as defined by Gadeyne. Sparkle is clearly defined by applicant (see above).

The office action states Gadeyne et al. does not show means of dividing a video signal for a brightness level signal and lower brightness level signal. Applicant agrees.

The office action states Iwaki teaches dividing a video signal for a picture into a higher luminance (brightness) level signal and lower luminance (brightness) level signal, delaying one of the signals (Drawing 1, items 1-12, in Detailed Description See page 1-3, paragraphs 008-0015).

Applicant respectfully submits Iwaki fails to disclose or suggest any approach useful or adaptable for reducing the effects of orthogonal fields in adjacent pixels. Iwaki is directed to facsimile apparatus (paragraph 0001). Facsimile apparatus do not suffer the effects induced in an LCD display by orthogonal fields of adjacent pixels. Iwaki teaches a way to increase resolution by mapping two pixels (white white; white black; black black) to one pixel based on the brightness level of one pixel. (See paragraph 21). This mapping occurs on a pixel by pixel basis.

Further, Iwaki fails to teach a step of " delaying said higher brightness level signal to match a processing delay incurred by said low pass filtering" as recited in applicant's claim 1. The delay disclosed by Iwaki is applied regardless of brightness level. Please refer to Iwaki schematic drawing 1. It can be seen that delay elements 1,2,and 3 are employed without any brightness determination as made by comparators 4,5,6 and 7. The results of the comparison are provided to a threshold generating circuit 10 and are not subject to any delay based on brightness level. Therefore, Iwaki fails to teach a step of " delaying said higher brightness level signal to match a processing delay incurred by said low pass filtering".

Furthermore, there is no suggestion in Iwaki that his teaching of classifying pixel brightness level in order to replace one pixel data by two pixel data to increase resolution has any applicability to an LCD sparkle artifact problem.

The office action states it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Iwaki approach for reducing sparkle artifacts in

the Gadeyne et al. apparatus to obtain image with fidelity without causing a pattern (See Purpose in Iwaki reference).


Applicant respectfully asserts that the Office has failed to meet its burden of establishing a prima facie case of obviousness regarding the combination of Gadeyne and Iwaki. See MPEP 2143 Basic Requirements of a *Prima Facie* Case of Obviousness.

All of applicant's arguments with respect to claim 1 are applicable to the rejection of claims 11 and 21. The claims remaining in the case are dependent claims therefrom. Applicant believes independent claims 1, 11 and 21 are in condition for allowance. The remaining dependent claims are also believed to be in condition for allowance.

Having fully addressed the rejections of the office action, it is believed, in view of the preceding remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's attorney at (609) 734-6892, so that a mutually convenient date and time for a telephonic interview may be scheduled.

Please charge any fees to Deposit Account 07-0832.

Respectfully submitted,

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